E_1 = Selecting urn I

E_2 = selecting urn II

E_3 = Selecting urn III

A = Drawing 1 white and 1 red balls.

$P(E_1) = 1/3$; $P(E_2) = 1/2$; $P(E_3) = 1/2$

$P(A/E_1) = P$ [Drawing 1 red and 1 white from urn 1]

$$= \frac{{}^1C_1 \times {}^3C_1}{{}^6C_2} = \frac{1 \times \cancel{3}}{\cancel{3}\ \cancel{6} \times 5/\cancel{2}} = \frac{1}{5}$$

$$P(A/E_2) = \frac{{}^2C_1 \times {}^1C_1}{{}^4C_2} = \frac{\cancel{2} \times 1}{\cancel{2}\ \frac{4 \times 3}{\cancel{2}}} = \frac{1}{3}$$

$$P(A/E_3) = \frac{{}^4C_1 \times {}^3C_1}{{}^{12}C_2} = \frac{\overset{2}{\cancel{4}} \times \cancel{3}}{\cancel{2}\ \frac{6\ \cancel{12} \times 11}{\cancel{2}}} = 2/11$$

By baye's theorem :

$$P\left(\frac{E_1}{A}\right) = \frac{P(E_1) \times P(A/E_1)}{P(E_1) \times P(A/E_1) + P(E_2) \times P(A/E_2) + P(E_3)P(A/E_3)}$$

$$= \frac{1/3 \times 1/5}{(1/3 \times 1/5) + (1/3 \times 1/3) + (1/3 \times 2/11)} = \frac{\cancel{1/3}(1/5)}{\cancel{1/3}(1/5 + 1/3 + 2/11)}$$

$$= \frac{1/5}{1/5 + 1/3 + 2/11} = \frac{1/\cancel{5}}{\frac{118}{\cancel{165}\ 33}} = \frac{33}{118}$$